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United States Environmental Protection Agency
Region 9

In the Matter of :	)	
	)	
Iron Mountain Mine	)	Order No. 90-08
	)	
Iron Mountain Mines, Inc., T.W. Arman, and Rhone-Poulenc Basic Chemicals, Co.	)	
	)	
Respondents.	)	
	)	
Proceeding under Section 106 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, (42 U.S.C. section 9606)	)	

ORDER

I. Jurisdiction

This Order is issued to Iron Mountain Mines, Inc., T.W. ("Ted") Arman, and Rhone-Poulenc Basic Chemicals Co. (formerly Stauffer Chemical Co., A Division of Rhone-Poulenc) (Respondents) pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, by authority delegated to the Administrator of the United States Environmental Protection Agency (EPA), and redelegated to the EPA Regions.

The Director of the Hazardous Waste Management Division, EPA Region 9, has determined that there may be an imminent and substantial endangerment to the public health, welfare or the environment because of the release and threatened release of hazardous substances from the Iron Mountain Mine facility, including past releases and continuing threatened releases.

II. Definitions

Unless otherwise expressly provided herein or below, terms used in this Order which are defined in the Comprehensive Environmental Response, Compensation and Liability Act, as amended ("CERCLA"), or in regulations promulgated under CERCLA, shall have the meaning assigned to them in the statute or regulations. Whenever terms listed below are used in this Order or in the Exhibits or Appendices attached hereto or incorporated hereunder, the following definitions shall apply:

A. "Appendix A" shall mean the Record Of Decision (ROD) for the interim Remedial Action.

B. "Appendix B" shall mean the attached technical specifications for the Upper Spring Creek Diversion.

C. "Appendix C" shall mean the attached technical specifications for the South Fork of Spring Creek Diversion.

D. "Appendix D" shall mean the Statement of Work for the workplan and schedule.

E. "Contractor" shall mean the individual, company or companies retained by or working on behalf of Respondent(s) to undertake and complete the Remedial Action.

F. "Day" shall mean a Calendar day unless expressly stated to be a working day. "Working day" shall mean a day other than a Saturday, Sunday or legal holiday. In computing any period of time under this Order, where the last day would fall on a Saturday, Sunday, or legal holiday, the period shall run until the end of the next working day.

G. "EPA" shall mean the United States Environmental Protection Agency.

H. "National Contingency Plan" or "NCP" shall mean the National Contingency Plan promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, codified at 40 C.F.R. Part 300, including any amendments thereto.

I. "IMM Site" or the "Site" means the "facility," as that term is defined at Section 101(9) of CERCLA, 42 U.S.C. § 9601(9), which is located at Iron Mountain Mine, including all locations

where hazardous substances released at or from IMM have come to be located.

J. "Oversight" means the United States' inspection of remedial work and all actions necessary to verify the adequacy of performance of activities and reports of Respondents as required under the terms of this Order.

K. "Record of Decision" or "ROD" shall mean the document signed by the EPA Assistant Administrator on October 3, 1986, which describes the Remedial Action to be conducted at the Site, and which is attached hereto as Appendix A.

III. Findings of Fact

Site description

Iron Mountain Mine ("IMM" or "the Site") is located in the southeastern foothills of the Klamath Mountains, approximately nine miles northwest of the City of Redding. Between the 1860's and 1963, IMM was periodically mined for iron, silver, gold, copper, zinc, and pyrite. The mine area is located on 4,400 acres of property that includes an open pit mine, underground workings, waste rock dumps and tailings piles.

IMM averages 70-80 inches of precipitation per year, most of it falling in the form of rain between the months of November and April.

IMM is drained by Boulder Creek to the north, and Slickrock Creek to the south of the mine. Boulder Creek, a perennial stream, receives a portion of its flows from the Lawson and Rich-

mond adits via their mine portals. Slickrock Creek, an intermittent stream, receives discharges from underground seepage and surface flows from the Brick Flat Pit area. A debris slide diverted the original Slickrock Creek drainage and buried adits from which acid mine drainage is emanating.

Slickrock Creek and Boulder Creek flow southeastward into Spring Creek, which flows into the Spring Creek Reservoir, created by the construction in 1963 of the Spring Creek Debris Dam, a unit of the Central Valley Project. Releases from Spring Creek drain into Keswick Reservoir, where they mix with releases of clean water from Shasta Dam.

Historic mining activity at IMM has fractured the mountain increasing access of surface water and rain water and oxygen to the mineralized zones within the mine. Precipitation and surface water infiltrating the mountain form sulfuric acid in the presence of oxygen due to the oxidation of the pyrite. The sulfuric acid is drained by the mine workings and leaches out copper, cadmium, zinc and other metals. This heavy metal laden acid mine drainage flows out of the mine portals and seeps. Much of the metals bearing acid mine drainage is ultimately channeled by the creeks into the Spring Creek Reservoir. The Bureau of Reclamation periodically releases the stored acid mine drainage impounded behind Spring Creek Debris Dam into Keswick Reservoir. Planned releases are timed to coincide with the presence of diluting waters from Shasta Dam. On occasion, unplanned spills and excessive waste releases have occurred from Spring Creek

Debris Dam, resulting in the release of harmful quantities of metals in the Sacramento River. In addition, over time there has been an accumulation of metals-bearing sediments in the Spring Creek and Keswick Reservoirs and in the Sacramento River.

History of site ownership

IMM was first secured for mining purposes in 1865. Limited mining began in 1879 for the recovery of silver and gold. In 1895, IMM was sold to Mountain Mining Co., Ltd., following discovery of massive copper sulfide deposits. Mining continued under their ownership until 1897 when the property was transferred to Mountain Copper Co., Ltd. of London, England. Mountain Copper Co., Ltd., conducted extensive mining operations at the site during the first half of the twentieth century. In 1955 a large landslide covered two mine portals in Slickrock Creek Canyon. In 1956, underground mining of the Richmond ore body ceased. Open pit mining of the Brick Flat Pit continued until 1962.

In 1967, Stauffer Chemical Co. acquired all of the shares of Mountain Copper Co., Ltd. In 1969, Mountain Copper Co., Ltd., sold the properties comprising Iron Mountain Mine to Mountain Copper, Ltd.'s sole shareholder, Stauffer Chemical Co. Stauffer Chemical Co. subsequently liquidated Mountain Copper Co., Ltd.

Stauffer operated cementation plants on the property at least part of the time it owned IMM. Acid mine drainage continued to be formed during this period of ownership and the release of hazardous substances into the environment at IMM continued during

the period of Stauffer's ownership of IMM. On November 5, 1976, the Regional Water Quality Control Board, Central Valley Region ("Regional Board") issued Stauffer an order requiring Stauffer to take corrective measures to reduce the discharge of heavy metals into the Sacramento River.

In December 1976, Stauffer transferred thirty one parcels of the IMM property to Iron Mountain Mines, Inc. ("IMMI").[1] IMMI, a California corporation, is the current owner of IMM. Ted Arman is the president of IMMI. IMMI has owned and operated the site since 1976. Since 1977, IMMI has operated off and on two copper cementation plants to recover copper from the acid mine drainage from the Slickrock and Boulder Creek drainages.

Subsequent to the sale of the IMM property, Stauffer was itself the subject of several transactions. Stauffer Chemical Co. is currently Rhone-Poulenc Basic Chemicals Co., a Delaware corporation, having changed its name September 18, 1989 from Stauffer Chemical Co., a Division of Rhone-Poulenc, Inc.

Regulatory history

Prior to the IMMI's acquisition of the property, on October 25, 1976 and November 1, 1976, Regional Board staff contacted corporate officers and legal staff of IMMI to present Regional Board concerns regarding the discharge of heavy metals into Spring Creek. At that time, IMMI agreed that the discharge from

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1. Five parcels were transferred to IMMI in December, 1980.

the property is a water quality problem and stated their goal was to eliminate most, if not all, of the discharges from IMM.

On June 9, 1977, IMMI submitted a report of waste discharge for the discharge of acid mine drainage and run-off containing high concentrations of metals and acid compounds to the Regional Board. At that time, the Regional Board referenced a 1976 United States Geological Survey Report to the effect that Spring Creek contributes 50 percent of the copper and 42 percent of the zinc to the Sacramento River at Redding. The Regional Board adopted waste discharge requirements for discharge of acid mine drainage and run-off from several non-point sources in July 1977. On August 17, 1977 the Regional Board issued IMMI an order requiring that IMMI, among other matters, reduce the rate of discharge of copper into Slickrock Creek from the Old Mine/No. 8 by 95 percent and eliminate or reduce to the maximum extent practicable, the discharge into Boulder Creek of run-off containing heavy metals.

On September 22, 1978, the Regional Board issued IMMI waste discharge requirements and an NPDES permit (Order 78-152) for discharges of copper cementation plant effluent of treated mine drainage from the Richmond and Hornet Mines into Boulder Creek and from the Old Mine/No. 8 into Spring Creek.

On January 9, 1979, the Regional Board notified IMM of violations and threatened violations of Order No. 78-152 and on January 26, 1979, issued IMMI a cease and desist order for these violations and threatened violations. On July 27, 1979, the Regional Board found IMMI in violation of Order No. 78-152 and

the cease and desist order. The Regional Board found that IMMI partly complied with the Order for only two weeks. The inefficient operation of its metals removal operations resulted in a potential overflow condition at Spring Creek Debris Dam and required controlled releases from the Spring Creek Debris Dam. Not only did this event require the otherwise unnecessary release of 70,000 acre feet of irrigation water, the Regional Board estimated that the release of IMM contaminated water killed 10 percent of the juvenile chinook salmon and 50 percent of the juvenile steelhead trout present in the Sacramento River below Keswick Dam.

This matter was referred to the California Attorney General and in July 1980 a stipulated preliminary injunction was issued by Shasta Superior Court. As part of that stipulated injunction, IMMI agreed to install within six months a new system for treatment of zinc, cadmium, and other metals. In March 1981, IMMI was found in contempt of court for failure to comply with conditions in the injunction.

On July 24, 1981, the Regional Board found that IMMI continued to be in violation and requested assistance in abating the nuisance from other public agencies.

<u>EPA involvement</u>

On April 5, 1982, EPA issued general notices of liability to Stauffer and IMMI for the past and continuing threatened releases of hazardous substances from IMM and the resulting damage to and

destruction of natural resources.

On September 8, 1983, IMM was included on the EPA National Priorities List of the nation's most contaminated sites. That month, EPA commenced a Remedial Investigation and Feasibility Study ("RI/FS") to study and evaluate potential remedies for the Site. During the course of that investigation, which extended from September 1983 to April 1985, EPA conducted weekly sampling of five major sources at the mine and three locations on Spring Creek, and biweekly sampling at four locations along the Sacramento River for heavy metals; installed flow measurement stations at eight locations, including mine portals and downstream receiving waters; measured precipitation at six gauges throughout the area; reviewed all existing literature on the site; conducted a groundwater investigation; and conducted two comprehensive surface sampling surveys, involving 76 sampling points, in September 1983 and December 1983.

During a dry period in September 1983 and a rainy period in December 1983 EPA conducted the two intensive sampling programs to locate and quantify the sources of heavy metals pollution at the IMM. The Regional Board conducted sampling in April 1983 which reflect usual late winter conditions when the mountain is saturated. The sampling station locations are identified in Figure 2 of the Record of Decision. The rankings of the heavy metals contribution for copper, cadmium and zinc are shown in Figure 3 of that document.

The RI identified five major sources as responsible for ap-

proximately seventy two percent of the copper and eighty six percent of the zinc and cadmium being discharged from the site during the sampling period. These sources were: the Richmond Portal, the Lawson portal, Old Mine/No. 8 seep, Big Seep, and the Brick Flat Pit By-Pass. In addition to the five major sources, EPA identified numerous other sources of releases of metals and acid mine drainage at the Site. The studies completed by EPA in 1983 show that the flow of acid mine drainage through tailings piles on the IMM property is also contributing to metals contamination.

On October 3, 1986, Assistant Administrator J. Winston Porter approved a Record of Decision for the Site based substantially upon the information developed under the RI/FS. Pursuant to 40 C.F.R. § 300.68(i)(5)(ii), the remedy selected did not meet all applicable or relevant and appropriate federal requirements because of the need to use Fund moneys at other sites. Consequently the Iron Mountain Mine ROD did not address all sources of contamination at the Site or the means to correct all releases.

The ROD approved for the Site authorized the following activities: the construction of a cap over the Richmond mineral deposit to reduce infiltration into this source of acid mine drainage; diversion of clean surface water from the Upper Spring Creek watershed before it reaches the portion of the basin affected by IMM; diversion of clean water from the South Fork of Spring Creek; diversion of clean water from Upper Slickrock Creek; enlargement of the Spring Creek Debris Dam; installation

of necessary perimeter controls; and conducting a study to better define the use of low density cellular concrete to minimize the formation of acid mine drainage.

This order requires Respondents to undertake necessary action to complete the diversion of clean water from the South Fork of Spring Creek and the diversion of clean water from Upper Spring Creek as expeditiously as possible, as provided in Section V below.

On July 19, 1988, EPA initiated construction of the partial cap over Richmond mineralized zone. As part of that construction, EPA utilized tailings materials from the Minnesota Flats area as well as selected other tailings piles which contained relatively high concentrations of copper, cadmium, and zinc.

EPA began design of the stream diversion structures in September 1987. EPA began construction of the Slickrock Creek diversion in July, 1989.

<u>Uncontrolled sources of contamination</u>

Additional sources requiring control include the tailings piles, mineral stockpiles and dumps and seeps in the Boulder Creek and Slickrock Creek drainages. During storm events, tailings piles, mineral stockpiles and dumps in the Boulder Creek drainage contribute up to 7 percent of the cadmium, 20 percent of the copper and 4 percent of the zinc in Boulder Creek. Groundwater and surface water migrating through an old waste rock dump serve as the sources of the drainage from the Big Seep in

the Slickrock Creek drainage. This seep and others in Slickrock Creek contribute from two percent to 25 percent of the hazardous metals in Slickrock Creek. The hematite pile along Slickrock Creek contributes about one percent of the metals in Slickrock Creek.

The studies completed by EPA in 1983 show that site 14, a tailings pile with a seep located above Boulder Creek, contributes as much as 26 pounds a day of heavy metals copper, cadmium and zinc; site 34, the hematite pile, provides runoff containing up to 28 pounds a day of heavy metals; and site 15, tailings with a seep located near site 14, is the source of up to 13 pounds a day of these metals. A fourth tailings pile, site 90, furnished up to 7.8 pounds of metals a day. Site 90 was substantially removed by EPA in 1988 and used as fill material in the cap at Brick Flats Pit. In addition to the tailings pile studied in the the 1983 studies, there are numerous tailings piles scattered about the property which have the potential to contribute metals contamination in the Spring Creek drainage.

Operation of cementation plants has historically been used to treat some of the acid mine drainage in the Boulder Creek and Slickrock Creek drainages. Two cementation plants have been operated at IMM, one in Boulder Creek and a second plant in Slickrock Creek. These plants, when properly operated have reduced, but not eliminated, the copper concentrations in the acid mine drainage. The cementation plants do not appreciably reduce cadmium or zinc concentrations. The cementation plants

receive flows from some of the main sources of contamination at IMM, including the Richmond portal, the Lawson portal and the Old Mine/No. 8 seep.

The discharge from the Boulder Creek cementation plant contributes approximately 20 to 40 percent of the copper, 90 to 95 percent of the cadmium, and 90 to 95 percent of the zinc measured in Lower Boulder Creek. The Boulder Creek cementation plant receives acid mine drainage continually from the Richmond and Lawson mine portals through a series of pipes and flumes. Leaks and spills from the collection system are additional sources of pollutant discharges.

The Slickrock cementation plant receives drainage discharged continuously from the Old Mine/No. 8 mine seep. The discharge from the Slickrock cementation plant contributes approximately 75 to 95 percent of the copper, cadmium, and zinc measured in Lower Slickrock Creek.

On July 19, 1988, the Regional Board adopted Cleanup and Abatement Order No. 88-713 ordering IMMI to control continuing discharges of metals. The Order required IMMI to reduce the discharge of acid from the Richmond workings to achieve a 95 percent reduction of acid and heavy metal concentrations; continue to treat the Richmond adit discharge through April 1, 1989, or later if deemed necessary by the Regional Board; and implement modifications as needed and continue operating the Boulder and Slickrock copper cementation plants to achieve 95 percent copper removal from the Lawson and No. 8 adit flows. The Regional Board

issued this Order to prevent injury to fish and other aquatic resources as a result of toxic metal concentrations. Because of the prevailing drought conditions, water storage in Shasta and Trinity Reservoirs was low, rendering these historic sources of dilution flows substantially unavailable in the event of a release of IMM contaminated water from Spring Creek Reservoir. If the discharge of acid and metals were not abated, the Regional Board found, "the continued discharge during the upcoming fall and winter will cause a condition of pollution and nuisance in Keswick reservoir and the Sacramento river. The acid mine drainage, without the benefit of dilution from receiving waters, will result in concentrations of heavy metals that will be acutely toxic to fish and other aquatic life and will unreasonably affect beneficial uses in Keswick Reservoir and the Sacramento River."

The California Department of Fish and Game, in a letter supportive of the Regional Board's action, stated that "[w]ithout increased treatment, uncontrolled releases of acid mine drainage mixed with the legal minimum streamflow release from Keswick Dam will result in large scale destruction of fishlife as well as loss of domestic water supplies." (Letter of July 8, 1988 from A.E. Naylor, Department of Fish and Game to William Crooks, Regional Board.) The Department of Fish and Game identified the following fisheries resources at risk: winter run chinook, fall run chinook, spring-run and late fall-run chinook, and steelhead trout and juvenile rainbow trout. The Department of Fish and Game

estimated the economic value of the fall run chinook population in the area impacted by the mine discharge as over $30 million for 1988 and stated that an extremely popular sport fishery is supported by the fall-run and resident rainbow trout.

The Regional Board's findings noted, among other matters that the Richmond adit is the source of 80 percent of the zinc and cadmium and 40 percent of the copper discharged from the mine. Although the copper cementation plant removes copper, this process does not reduce the zinc or cadmium which are equally toxic to aquatic life. The Regional Board stated that lime or limestone neutralization as a method of reducing metals levels has been thoroughly tested on IMM and has been proven to be an effective method of removing acids and toxic metals.

IMMI responded to the Order on July 29, 1988. IMMI refused to comply with the Order, claiming that its diversion work had already "significantly reduced mine water discharges" and that "[i]t is most unlikely that the upcoming fall and winter rainfall will cause a condition of pollution or nuisance." After a review of this response, the Regional Board wrote IMMI on September 1, 1988 that IMMI's response was inadequate, that IMMI was in violation of the Order, and that the State would proceed with attempts to treat the mine drainage.

In September, 1988, EPA in cooperation with the Department of Fish and Game and the Regional Board began setting up a treatment plant to treat the acid mine drainage from the Richmond Portal. The performance goal for that operation was the removal of

95 percent of the cadmium and zinc concentrations in the acid mine drainage. The treatment plant was scheduled to be in place by November 1, 1988, in time for the beginning of the usual rainy season. EPA operated the treatment plant from mid-December, 1988 to February 28, 1989.

EPA's operation of the lime treatment facility resulted in a significant reduction in the metals and acidity of the mine runoff. As a result, during the winter months EPA was operating the lime treatment facility it was possible to release impounded waters behind Spring Creek Debris Dam into Keswick Reservoir without adverse impacts despite the low quantities of receiving water available for dilution. In early March, EPA removed its lime treatment plant when it appeared that the drought would continue. At that time, the Spring Creek Reservoir was evacuated to the point that there was sufficient capacity to store average runoff during March.

In March, 1989, the Bureau of Reclamation reduced flows in the Sacramento River from Keswick Dam to 2300 cubic feet per-second, as allowed under a 1960 Memorandum of Understanding between the Department of Fish and Game and the Bureau of Reclamation.

Unusually heavy March storms, greatly exceeding the monthly average, filled the Spring Creek Debris Dam, resulting in a dangerous situation in which high acid spillovers from Spring Creek would enter the river without sufficient diluting flows from the Central Valley Project. Spring Creek Debris Dam overflowed at a

high rate for a week. To minimize damage over the entire spill period, an estimated 64,000 acre feet of water were released to provide diluting flows. Despite the release of additional dilution flows, the overflow killed an estimated 10 percent of the late fall chinook salmon and 50 percent of the steelhead trout.

On July 25, 1989, Pete Bontadelli, Director of the California Department of Fish and Game wrote Daniel McGovern, Regional Administrator, Region 9, requesting EPA assistance in addressing the impending fish emergency for the winter of 1989-90. In that letter, Mr. Bontadelli stated that "[p]oor water supply conditions and the continued discharge of acid and toxic metals from the site threaten to adversely impact very valuable species of salmon and steelhead....The prolonged drought over the last two years coupled with high water demands is forecasted to result in poor water supply conditions in Shasta Reservoir this winter. The U.S. Bureau of Reclamation (USBR) had previously stated that releases to dilute toxic waste from Iron Mountain Mine would not be made available when the reservoir level is so low that there is no justification for anticipatory or actual flood control releases. The forecast for this winter's storage in Shasta Reservoir is approximately a million acre-feet below the flood control level (based upon a historic annual inflow to Shasta Reservoir at 30th percentile)."

In response to this renewed threat to the fisheries in the fall of 1989, EPA issued Respondents an order requiring, among other matters, implementation of a treatment plant during the

winter of 1989-1990.

In January 1989, the Bureau of Reclamation, working under an interagency agreement with the EPA, completed a thirty per cent design for the Upper Spring Creek diversion and a thirty per cent design for the South Fork Spring Creek diversion. On October 3, 1989, EPA notified Respondents that it would be inviting them to take over the construction, operation and maintenance of the diversion structures. On January 26, 1990, EPA formally invited Respondents to participate in negotiation of a Consent Decree whereby Respondents could assume responsibility for construction of the diversions. The Respondents failed to submit an offer to do so.

Stauffer has exhibited an interest in assuming responsibility for conducting an investigation and study of source controls. EPA has invited further discussions of this matter. Under the Interim ROD signed in 1986, the diversions as well as a further remedial investigation/feasibility study of source controls are necessary response actions at IMM. EPA is currently conducting an RI/FS to determine appropriate source controls.

Affected environment

The Sacramento River is a valuable fisheries resource and is used as a source of drinking water by the City of Redding, with a population of over 50,000.

The Central Valley Regional Board adopted water quality standards applicable to the Sacramento River and the tributaries

which flow into the Sacramento River from IMM on April 27, 1984. The State Water Resources Control Board and the EPA subsequently approved these standards. These standards limit dissolved concentrations of cadmium (0.00022 mg/l), copper (0.0056 mg/l), zinc (0.016 mg/l), and pH (6.5 to 8.3 with a maximum deviation of 0.3 units from ambient conditions). The California Department of Fish and Game has identified these levels of metals as protective of all life stages of anadromous salmon and steelhead below Keswick Dam. These recommended levels were adopted by the Regional Board as Basin Plan objectives for the Keswick Dam area and approved by the State Board in August, 1984. EPA approved the objectives under CWA 303 on August 7, 1985. EPA Water Quality Criteria for protection of aquatic life below Keswick Dam are cadmium (0.00055 mg/l), copper (0.0054 mg/l), and zinc (0.047 mg/l).

Aquatic Life

The runoff of metals bearing acid mine drainage has impacted the fishery resources of the Sacramento River. The major fishery resources of the Sacramento River below Keswick Dam include migratory populations of salmon and steelhead and resident populations of wild trout. The adult salmon and steelhead migrate from the ocean to the river where they reproduce. The young remain in the river through the juvenile life stage or sometime longer in the case of steelhead. Metal laden discharges from the Spring Creek Basin frequently occur at the time of year that the salmonoid life stage most sensitive to metal toxicity is abundant

in the river.

The monetary value of the chinook salmon and steelhead trout runs produced upstream from the Red Bluff Diversion dam has been estimated to be $33.7 million annually. The economic value of these fishery resources, once restored, is expected to increase to $72 million annually. The metals from IMM have contributed to fish kills as well as incidents of sublethal toxicity which reduce the overall productivity of the population, including effects such as reduced growth rates, physiological problems, and diminished immune response.

The continuous release of metals from IMM has contributed to a steady decline in the fisheries population in the Sacramento River. California Fish and Game has estimated that the fall run of chinook salmon in the upper Sacramento River has ranged from an estimated high of 400,000 in 1953 to a low of 20,000 with an average decline of 87 percent in the last 20 years. The average run of salmon has declined from from 275,000 to 75,000 salmon. The upper Sacramento River once produced half of the state's chinook salmon.

IMM has been responsible for numerous fish kills in the Sacramento River. There have been thirty nine documented fish kills near Redding since 1940. In February, 1964 an estimated 100,000 fish were killed in a single incident. A fish kill in January-February 1967 killed an estimated 47,100 trout. In 1969, a significant fish kill that destroyed all the salmon fry in the Redding area, occurred when the Spring Creek Debris Dam over-

flowed. During overflow of the debris dam in January, 1978, there was a documented loss of 37 percent of the salmon fry in the Redding area. In January 1979, a release of contaminated water made necessary by IMMI's violation of its Regional Board order led to another significant fish kill. Most recently, IMMI's violation of another Regional Board order was a contributing factor in yet another fish kill in March, 1989. In addition to these fish kills, an accidental release of IMM sediments impounded behind the Keswick Dam occurred in the Fall of 1988, resulting in a plume of heavy metal laden sediments flowing down the Sacramento River, causing the City of Redding to close its municipal water intake wells.

In Mr. Bontadelli's letter requesting EPA assistance with the impending fish emergency for the winter of 1989-90, he stated that "It is well documented that drainage from Iron Mountain Mine contains concentrations of metals and acid toxic to fish and other aquatic life. Fishery resources vulnerable to destruction include four races of chinook salmon, steelhead, and rainbow trout. The chinook salmon include: the winter-run chinook, which is going to be listed as a State endangered species and a Federal threatened species; spring-run and late fall-run chinook, which are both at low population levels; and the fall-run chinook, which is the stock that supports California's important sport and commercial salmon fishery. Last year the spawning grounds that were protected from fish kills from Iron Mountain Mine produced over 30 million dollars worth of salmon. Historic fish kills

have destroyed fish that are life stages between embryo and adult in as little as a 48-hour exposure period. Fish kills impact the sport and commercial salmon fisheries in future years.

Water Resources

In recent years, recurring drought conditions have underscored the importance of water conservation in California. The continued need to rely upon water from Lake Shasta and Keswick Reservoir to mitigate the impacts of acid mine drainage renders significant quantities of water unavailable for beneficial uses, resulting in a significant adverse impact on the human environment. An estimated 64,000 acre feet were released in March, 1989 to prevent a massive fish kill. During a late winter storm it normally requires a Shasta release 40 to 50 times that of Spring creek to provide non-toxic conditions for salmon.

As water demands continue to grow in the state, it is probable that less dilution water will be made available for IMM wastes.

Public health impacts.

Near its source, the acid mine drainage contains sulfuric acid in concentrations that could cause serious eye injuries and skin irritation through dermal contact. Although the property owner has posted the property to discourage trespassers who might become exposed, the property is located between two heavily used National Forests and direct exposure can not be ruled out as a

possibility.

Direct ingestion of contaminated fish from the Sacramento River does not pose a present health threat. However, without remediation, IMM releases will continue to deposit effluent in sportfishing areas and the concentration of cadmium will continue to be elevated above normal levels, resulting in potential bioaccumulation of cadmium in the livers and kidneys of those who ingest contaminated fish from the river.

IV. Conclusions of Law

A. Iron Mountain Mine, Inc., Ted Arman and Rhone-Poulenc Basic Chemicals, Co. are "persons" as defined in Section 101(21) of CERCLA, 42 U.S.C. § 9601(21).

B. The transaction whereby the IMM property was transferred from Stauffer to IMMI is a "contractual relationship" as defined in Section 101(35) of CERCLA, 42 U.S.C.§ 9601(35).

C. The Iron Mountain Mine is a "facility" as defined in Section 101(9) of CERCLA, 42 U.S.C. § 9601(9). In United States v. Iron Mountain Mines and T.W. Arman (E.D.Cal.; August 29, 1988) Docket No. 87-1189, p. 3, the court found that the Site is a facility as defined by CERCLA.

D. Copper, cadmium, zinc and acid mine drainage are "hazardous substances" as defined in Section 101(14) of CERCLA, 42 U.S.C. § 9601(14). In United States v. Iron Mountain Mines and T.W. Arman (E.D.Cal.; August 29, 1988) Docket No. 87-1189, p. 3, the court found that hazardous substances within the meaning of

CERCLA are located at the Site.

E. The release of acid mine drainage, containing cadmium, copper and zinc constitutes a "release" or "threatened release" of hazardous substances into the environment as defined in Section 101(22) of CERCLA, 42 U.S.C. § 9601(22). In United States v. Iron Mountain Mines and T.W. Arman (E.D.Cal.; August 29, 1988) Docket No. 87-1189, p. 3, the court found that EPA's conclusions "that there had been releases of hazardous substances at the Site and that releases would occur in the future...are overwhelmingly supported by the available data."

F. Iron Mountain Mine, Inc., Ted Arman and Rhone-Poulenc Basic Chemicals, Co. are liable persons as provided in Section 107(a) of CERCLA, 42 U.S.C. § 9607(a).

G. Iron Mountain Mine, Inc. and Ted Arman are liable as the current owner and operator of IMM. Section 107(a)(1) of CERCLA, 42 U.S.C. § 9607(a)(1).

H. Rhone-Poulenc Basic Chemicals, Co. is liable as the owner and operator of the facility during the time of disposal. Section 107(a)(2) of CERCLA, 42 U.S.C. § 9607(a)(2). Rhone-Poulenc Basic Chemicals, Co. is liable as the successor corporation to Stauffer Chemical Co., the successor to Mountain Copper, Ltd. Stauffer's acquisition of all of the stock of Mountain Copper, Ltd., its sale of the mine to itself and dissolution of Mountain Copper, Ltd. constitute a de facto merger. Having conducted the vast majority of the mining activity directly responsible for the continued pollution of the Sacramento River,

Mountain Copper, Ltd. and its successors, Stauffer Chemical and Rhone-Poulenc Basic Chemicals, Co., are directly and causally responsible for the formation of acid mine drainage and the release of hazardous substances into the Sacramento River from the Iron Mountain Mine workings.

I. Rhone-Poulenc Basic Chemicals, Co. is also liable by the sale of this property with known adverse environmental impacts to IMMI, a small corporation with insufficient capital to address the environmental problem. In doing so, Rhone-Poulenc Basic Chemicals, Co. "arranged for disposal...of hazardous substances owned or possessed by such person, by any other party or entity, at any facility ...owned or operated by another party or entity...and containing such hazardous substances." Section 107(a)(3) of CERCLA, 42 U.S.C. § 9607(a)(3).

J. No statutory defenses are applicable to Respondents.

V. Determinations

Based on the Findings of Fact and Conclusions of Law, the Director, Hazardous Waste Management Division, EPA Region 9, has made the following determinations:

A. The releases and continuing threatened release of hazardous substances and pollutants or contaminants from the Iron Mountain Mine may present an imminent and substantial endangerment to the public health, welfare, or the environment.

B. In order to prevent or mitigate significant risk of harm to the environment, a remedial action must be commenced im-

mediately to reduce the release of acid mine drainage into the environment.

C. The remedial measures required by this Order are both necessary and consistent with the National Contingency Plan, 40 Code of Federal Regulations, Part 300.

D. The remedial measures required by this order were selected pursuant to the procedures of the National Contingency Plan. 40 Code of Federal Regulations, Part 300.

E. Section 116(e) of CERCLA, 42 U.S.C. § 9616(e) requires that the President assure substantial and continuous physical on-site remedial action commence at facilities on the National Priorities List in an expeditious manner.

F. This Order is necessary to prevent the further degradation of the Sacramento River with substantial adverse impacts on the public health and the environment. Based upon the estimates provided by the Bureau of Reclamation, hired by EPA to design the diversions, the time frames for completion of the diversions are reasonable and necessary.

G. This Order does not address all past damage and continuing threats of damage to the environment caused by the Respondents but requires completion of operable units which are part of a larger response at the facility.

VI. Work to be Performed

Based upon the Findings of Fact, Conclusions of Law and

Determinations, Respondents are hereby Ordered to implement the following measures under the direction of EPA.

A. General Obligations Regarding the Remedial Actions

1. Respondents shall finance and perform, at their expense, the implementation of the work as required by this Order and the Appendices hereto.

2. Notwithstanding any approvals which may be granted by the United States or other governmental entities, Respondents shall assume any and all liability arising from or relating to their acts or omissions or the acts or omissions of any of their contractors, subcontractors, or any other person acting on their behalf in the performance of the Remedial Action or their failure to perform fully or complete the Remedial Action.

3. Respondents shall appoint a representative ("Project Coordinator") designated by them to act on their behalf to execute the Remedial Action, in accordance with Section IX.

4. Respondents shall select a contractor (or contractors) who has relevant expertise in construction and the remediation of hazardous waste problems to conduct the Remedial Action. The selection of the contractor shall be subject to EPA approval. Within 30 days after the effective date of this Order, Respondents shall notify EPA in writing of the name, title and qualifications of any supervising contractor proposed to be used in carrying out work under this Order. If at any time thereafter Respondents propose to change supervising contractors, Respondents shall give written notice to EPA and shall obtain approval

from EPA before the new supervising contractor performs any work under this Order. All work performed by Respondents shall be performed by qualified contractors in accordance with the conditions and schedules specified in this Order.

5. Within 60 days of the effective date of this Order, Respondents shall submit for EPA review and approval the name of a qualified contractor who will perform independent oversight of Respondents' completion of the tasks identified in paragraph VI(B). Within 60 days of approval by EPA, Respondents shall contract for such services and shall maintain such contract until completion of the remedial action required by this Order.

6. While Respondents may collect, treat, stage, and secure materials on-site, they shall not redeposit hazardous substances back into the Site without the explicit approval of EPA.

7. Respondents shall dispose of any materials taken offsite in compliance with the EPA's Revised Procedures for Implementing Off-Site Response Actions ("Offsite Policy"). (EPA OSWER Directive 9834.11, November 13, 1987) and any amendments thereto.

8. Respondents shall submit all reports (daily, weekly, monthly, etc.) prepared by their contractors and subcontractors concerning this Order to EPA and EPA's designated oversight personnel, according to the schedules set forth in this Order.

9. Under the provisions of Section 104(e) of CERCLA, EPA explicitly reserves the right to observe the work of the Respondents as it is performed. In addition, at the request of EPA, Respondents shall allow split or replicate samples to be taken by

EPA and/or its authorized representatives, of any samples collected by the Respondents or anyone acting on the Respondents' behalf pursuant to the implementation of this Order. Within seven (7) days after the approval of any sampling plan (including the schedule for implementation), Respondents shall notify EPA of the intended date of commencement of the sampling activity. In addition, Respondents shall notify EPA within 48 hours prior to any modifications or proposed changes to any sample collection activity. Respondents shall notify EPA 30 days prior to the disposal of any such samples, and shall provide EPA with an opportunity to take possession of all or a portion of such samples.

10. Respondents shall notify EPA in a timely manner of any project which is likely to produce data or information of the types described in this Section.

11. All data, factual information, and documents submitted by Respondents to EPA pursuant to this Order shall be subject to public inspection.

12. All submittals required to be submitted to EPA for review by this Order or identified in any workplans developed hereunder, are subject to review and approval or modification by EPA. EPA may unilaterally modify any submittal or require the Respondents to resubmit any submittal for revisions if EPA determines the submittal is unacceptable. Any revised workplan and/or schedule shall be resubmitted within a time to be designated by EPA. Upon approval by EPA, the submittal shall be a binding portion of this Order. Respondents may not make any changes to an

approved submittal without EPA approval.

B. Work to be Done for the Diversions.

1. Within 30 days of the effective date of this Order, Respondents shall submit for EPA review and approval a pre-final design for implementation of the remedial action to construct the Upper Spring Creek Diversion described in Appendix B and a draft workplan and schedule for implementation.

1.1. Within 30 days of the receipt of EPA's comments on the pre-final design and draft workplan and schedule, Respondents shall submit a final design for implementation of the remedial action to construct the Upper Spring Creek Diversion described in Appendix B and a final workplan and schedule.

1.2. The workplan and schedule submitted pursuant to this paragraph shall provide for submittal of the following documents and completion of the following tasks, more fully described in Appendix D:

(i) Health and Safety Plan (draft and final)

(ii) Construction Management Plan (draft and final)

(iii) Construction Quality Assurance Plan (draft and final)

(iv) Start-up and Training Plan (draft and final)

(v) Operations and Maintenance Plan (draft, final draft and final)

(vi) Sampling and Analysis Plan (draft and final)

(vii) Contingency Plan (draft and final)

(viii) Final Construction Drawings and Specifications

(ix) Final Cost Estimate

(x) Submittal of Bid Documents for EPA Review

(xi) Completion of Construction

(xii) Certification of Construction Completion

(xiii) Final Construction Report

(xiv) Final Remedial Action Report

In no event may a schedule allow for completion of the Upper Spring Creek Diversion later than December 31, 1990.

2. Within 30 days of the receipt of the prefinal technical specifications and drawings for the South Fork Diversion, Respondents shall submit for EPA review and approval a pre-final design for implementation of the remedial action to construct the South Fork Diversion described in Appendix C and a draft workplan and schedule for implementation.

2.1. Within 30 days of receipt of EPA's comments on the pre-final design and draft workplan and schedule, Respondents shall submit a final design for implementation of the remedial action to construct the South Fork Diversion described in Appendix C and a final workplan and schedule.

2.2. The workplan and schedule submitted pursuant to this paragraph shall provide for submittal of the following documents and completion of the following tasks, more fully described in Appendix D:

(i) Health and Safety Plan (draft and final)

(ii) Construction Management Plan (draft and final)

(iii) Construction Quality Assurance Plan (draft and final)

(iv) Start-up and Training Plan (draft and final)

(v) Operations and Maintenance Plan (draft, final draft and final)

(vi) Sampling and Analysis Plan (draft and final)

(vii) Contingency Plan (draft and final)

(viii) Final Construction Drawings and Specifications

(ix) Final Cost Estimate

(x) Submittal of Bid Documents for EPA Review

(xi) Completion of Construction

(xii) Certification of Construction Completion

(xiii) Final Construction Report

(xiv) Final Remedial Action Report

In no event may a schedule allow for completion of the South Fork of Spring Creek Diversion later than November 31, 1990.

3. Immediately upon receipt of EPA's approval of the workplan and schedule for a diversion, Respondents shall begin implementation of the approved workplan. Respondents shall complete construction of the diversions in accordance with the approved workplan and schedule.

C. Respondents shall submit the following documents more fully described below and in Appendix D:

1. Monthly Progress Reports:

Respondents shall provide written progress reports to EPA on

a monthly basis. These progress reports shall describe all actions taken to comply with this Order, including a general description of activities commenced or completed during the reporting period, Remedial Design and Remedial Action activities projected to be commenced or completed during the next reporting period, and any problems that have been encountered or are anticipated by Respondents in commencing or completing the Remedial Design or Remedial Action activities. These progress reports shall be submitted to EPA by the 10th of each month for work done the preceding month and planned for the current month.

2. Monthly Operations and Maintenance reports.

3. Daily and weekly construction reports.

4. Quality Assurance/Quality Control Plan. Within 120 days of the effective date of this Order, Respondents shall submit a draft Quality Assurance/Quality Control Plan for EPA review and approval.

D. The provisions of this Order are severable. In the event any provision, section, sentence or requirement of the Order is ruled unenforceable or otherwise invalid such ruling shall not affect the validity of any other portion of the Order. This Order does not supercede or replace any previously existing order or any portion thereof. Compliance with the terms of this Order does not excuse noncompliance with the terms of any other order. Inability of any Respondent to complete the requirements of the Order in the time frames specified shall not be a valid reason for refusing compliance with the requirements of the Order.

E. Operations and Maintenance. In accordance with the requirements of Appendix D and the operations and maintenance plans to be completed pursuant to subparagraph B above, Respondents shall be responsible for all operations and maintenance of the remedial action.

VII. Worker Health and Safety Plan

The Worker Health and Safety Plan that the Respondents will submit pursuant to Section VI of this Order shall satisfy the requirements of the Occupational Safety and Health Guidance for Hazardous Waste Site Activities [October 1985 (DHH 5 NOISH) Publication No. 85-115] and EPA's Standard Operating Safety Guides (EPA, OERR, November 1984) and amendments thereto. The Emergency Response Plan that the Respondents will submit pursuant to Section VI of this Order shall address both workers at the Site and public exposure to releases or spills at and from the Site.

VIII. Quality Assurance/Quality Control Plan

A. The Quality Assurance/ Quality Control Plan ("QA/QC") plan that Respondents shall submit pursuant to Section VI of this Order shall, where applicable, be prepared in accordance with EPA guidance, Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans (QAMS-005/80), Data Quality Objective Guidance (EPA/540/G87/003 and 004), relevant EPA Region

IX guidance, and subsequent amendments to such guidances.

B. Respondents shall use QA/QC procedures in accordance with the QA/QC plans submitted pursuant to this Order, and shall utilize standard EPA chain of custody procedures, as documented in the National Enforcement Investigations Center Policies and Procedures Manual as revised in May 1986 and amendments thereto, and the National Enforcement Investigations Center Manual for the Evidence Audit, published in September 1981 and amendments thereto, for all sample collection and analysis activities, unless other procedures are approved by EPA. In order to provide quality assurance and maintain quality control regarding all samples collected pursuant to this Order, the Respondents shall, at a minimum, ensure that the following QA/QC measures are employed at laboratories utilized for analysis:

1. All contracts with laboratories utilized by Respondents for analysis of samples taken pursuant to this Order shall provide for access of EPA personnel and EPA authorized representatives to assure the accuracy of laboratory results related to the IMM Site.

2. Any laboratory utilized by Respondents for analysis of samples taken pursuant to this Order shall perform all analyses according to methods deemed satisfactory to EPA and submit all protocols to be used for analysis to EPA in the plans and documents required under this Order.

3. All laboratories utilized by Respondents for analysis of samples taken pursuant to this Order participate in

an EPA or EPA equivalent QA/QC program. As part of the QA/QC program and upon request by EPA, such laboratories shall perform at Respondents' expense analyses of samples provided by EPA to demonstrate the quality of each laboratory's data.

C. Respondents shall submit a quality assurance report to EPA as part of the monthly report for the months of March, June, September and December of each year. This report shall contain information that demonstrates that the Respondents are complying with this Section and the QA/QC Plan submitted pursuant to this Order.

IX. Project Coordinator

A. By the effective date of this Order, EPA and Respondents shall each designate a Project Coordinator to monitor the progress of the Remedial Action, to coordinate communication between EPA and the Respondents and to oversee the implementation of this Order. EPA and Respondents each have the right to change their respective Project Coordinator. Such a change shall be accomplished by notifying the other party in writing at least five calendar days prior to the change. To the maximum extent possible, communications between Respondents and EPA and all documents, including reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Consent Order, shall be directed through the Project Coordinators.

B. The EPA Project Coordinator shall have the authority

vested in the On-Scene Coordinator by 40 C.F.R. § 300 et seq., including such authority as may be added by amendments to 40 C.F.R. § 300, as well as the authority to ensure that the Remedial Action is performed in accordance with all applicable statutes, regulations, and this Order. The Remedial Project Manager for IMM for the purposes of this Order is:

Rick Sugarek
United States Environmental Protection Agency
Region 9
211 Main Street
San Francisco, California 94105
(415) 744-1071

C. The EPA Project Coordinator or On-Scene-Coordinator shall also have the authority to require a cessation of the performance of the Remedial Action or any other activity at the Site that, in the opinion of the EPA Project Coordinator or On-Scene Coordinator, may present or contribute to an endangerment to public health, welfare, or the environment or cause or threaten to cause the release of hazardous substances from the Site. The absence of the EPA Project Coordinator from the Site shall not be cause for stoppage of work.

D. Respondents' Project Coordinator may assign other representatives, including other contractors, to serve as a site representative for oversight of performance of daily operations during remedial activities.

X. Site Access

A. To the extent that the Site or any other area where work

is to be performed is presently owned or controlled by parties other than those bound by this Order or to the extent that access to or easements over property are required for the proper and complete performance of this Order, Respondents shall obtain access agreements from the present owners or those persons who have control over the property, including lessees, within sixty (60) days of the effective date of this Order. Site access agreements shall provide access to Respondents, Contractors, the United States, EPA, State and local agencies, and their representatives. In the event that site access agreements are not obtained within the sixty (60) day period, the Respondents shall notify EPA within sixty five (65) days of the effective date of this Order regarding both the lack of, and efforts to obtain, such agreements. If Respondents fail to gain access within 60 days, they shall continue to use best efforts to obtain access until access is granted.

B. During the effective period of this Order, Respondents shall provide the United States, EPA, the State, and their representatives, including contractors, access at all times to the site, and any contiguous property owned or controlled by any Respondent.

XI. Compliance With Applicable Laws And Regulations

All actions required to be taken pursuant to this Order shall be undertaken in accordance with the requirements of all applicable federal, state and local laws, regulations, and per-

mitting requirements, in accordance with CERCLA and the NCP.

XII. Data Exchange: Sampling and Analysis

A. Respondents shall provide EPA with all technical data and information relating to the environmental problems, public health threats, site conditions, site use and history, contaminant incidence and migration, and regional environmental conditions relating to the Site as such data and information becomes available, including but not limited to:

1. Previous studies or reports;
2. Communications between Respondents and local, state or other federal authorities;
3. Permits from local, state of federal authorities regarding hazardous substance use or contamination at the Site;
4. Raw analytical, monitoring, sampling, geographical, hydrogeological, geologic, meteorological, surface water, seismic, landfill gas, subsurface gas, or ambient air data, resulting from any environmental testing relating to the Site including documentation of all related Quality Assurance/Quality Control (QA/QC) results;
6. Technical working drafts and final reports, letter reports, work plans, documents, records, files, memoranda, status reports, and written material developed using any source, including EPA, relating to the Site;
7. Technical maps, computer generated graphics, charts, tables, data sheets, geologic cross- sections, lithologic logs, graphs, photographs, slides, or other such material developed relating to the Site; and
8. Computerized technical data and information relating to the Site, including any creation, sorting, display and organization of a data base.

B. Under the provisions of Section 104(e) of CERCLA, EPA explicitly reserves the right to observe the work of the Respondents as it is performed. In addition, at the request of EPA, Respondents shall allow split or replicate samples to be taken by EPA and/or its authorized representatives, of any samples col-

lected by the Respondents or anyone acting on the Respondents' behalf pursuant to the implementation of this Order. Within seven (7) days after the approval of any sampling plan (including the schedule for implementation), Respondents shall notify EPA of the intended date of commencement of the sampling activity. In addition, Respondents shall notify EPA within 48 hours prior to any modifications or proposed changes to any sample collection activity. Respondents shall notify EPA 30 days prior to the disposal of any such samples, and shall provide EPA with an opportunity to take possession of all or a portion of such samples.

C. Respondents shall notify EPA in a timely manner of any project which is likely to produce data or information of the types described in this Section.

D. All data, factual information, and documents submitted by Respondents to EPA pursuant to this Order shall be subject to public inspection.

E. Within 60 days of the effective date of this Order, Respondents shall propose to EPA a plan and system to manage and organize data collected pursuant to this Order. Upon approval by EPA, Respondents shall implement the data management plan and system.

XIII. Community Relations

As requested by EPA, Respondents shall cooperate with EPA in providing information to the public and shall participate in the preparation of appropriate information disseminated to the

public and in public meetings which may be held or sponsored by EPA to explain activities at or concerning the Site.

XIV. Retention of Records

A. Respondents shall preserve and retain all records and documents now in their possession or control or in the possession or control of their divisions, employees, agents, accountants, contractors or attorneys which relate in any manner to the Site, regardless of any document retention policy to the contrary, for six (6) years after the completion of the remedial action or termination of this Order, whichever is later.

B. Until this six (6) year period expires, the Respondents shall preserve, and shall instruct all contractors, all contractor's subcontractors, and anyone else acting on the Respondents' behalf at the IMM Site to preserve (in the form of originals or exact copies, or in the alternative, microfiche of all originals) all records, documents and information of whatever kind, nature, or description relating to the Site. During the six (6) year period following the completion of the Site Remedial Action, or earlier if requested by EPA, originals or copies of all such records, documents, and information shall be delivered to the EPA Project Coordinator or designee.

C. After this six (6) year period, the Respondents shall notify the EPA no later than sixty (60) days prior to the destruction of such documents. Upon request by EPA made within thirty (30) days of such notice, the Respondents proposing to

destroy records shall make available to the EPA originals or copies of any such records prior to their destruction.

XV. Notice of Obligations to Successors-in-Title

A. Within thirty (30) days after the entry of this Order, Respondents shall record a certified copy of this Order with the Recorder's Office, Shasta County, State of California. Thereafter, each deed, title, or other instrument of conveyance for property included in the Site shall contain a notice stating that the property is subject to this Order and any lien retained by the United States, and shall reference the recorded location of the Order and any restrictions applicable to the property under this Order.

B. The obligations of each Respondent who owns any interest in property included in the Site, with respect to the provision of access under Section X, shall run with the land and shall be binding upon any and all such Respondents and any and all persons who subsequently acquire any such interest or portion thereof (hereinafter "Successors-in-Title"). Within ten (10) days after the entry of this Order, each Respondent who owns any interest in property included in the Site shall record at the Registry of Deeds, or other office where land ownership and transfer records are maintained for the property, a notice of obligation to provide access and related covenants. Each subsequent deed to any such property included in the Site shall reference the recorded location of such notice and covenants applicable to the

property.

C. Any Respondent that owns an interest in property included in the Site and any Successor-in-Title shall, prior to the conveyance of any such interest, give written notice of this Order to the grantee and written notice to EPA of the proposed conveyance, the name and address of the grantee, and the date on which notice of the Order was given to the grantee. In the event of any such conveyance, the Respondent's obligations under this Order shall continue to be met by all Respondents and, subject to approval by the United States and the State, by the grantee.

XVI. Submittals

All submittals and notifications to EPA required by this Order or the plans shall be made to:

Director, Hazardous Waste Management Division
United States Environmental Protection Agency
Region 9
211 Main Street
San Francisco, California 94105

Copies of all submittals and notifications shall be sent to the Remedial Project Manager. An additional copy of each submittal shall be sent to the State at the following address: Department of Health Services, 10151 Croyden Way, Sacramento, CA 95827.

All approvals and decisions of EPA made regarding the submittals and modifications shall be communicated to Respondents by the Director, Hazardous Waste Management Division or the

Director's designee. No informal advice, guidance, suggestions, or comments by EPA regarding reports, plans, specifications, schedules, or any other matter will relieve Respondents of their obligation to obtain formal approvals as required by this Order.

XVII. Endangerment During Implementation

The Director, Hazardous Waste Management Division, EPA Region 9, may determine that acts or circumstances (whether related to or unrelated to this Order) may endanger human health, welfare or the environment and may order the Respondents to stop further implementation of this Order until the endangerment is abated.

In the event of any action or occurrence during the performance of the work which causes or threatens to cause a release of a hazardous substance or which may present an immediate threat to pubic health or the environment, Respondents shall immediately take all appropriate action to prevent, abate, or minimize such release or endangerment, and shall immediately notify EPA's Project Coordinator. If EPA's Project Coordinator is unavailable, Respondents shall notify the EPA Emergency Response Section, Region 9. Respondents shall take such action as in accordance with all applicable provisions of the Health and Safety and Contingency Plans developed pursuant to the Statement of Work.

XVIII. Nonliability of the Government

The United States Government and its employees and other representatives shall not be liable for any injuries or damages to persons or property resulting from the acts or omissions of Respondents, their employees or other representatives caused by carrying out this Order by virtue of Respondents compliance with this Order.

For the purposes of this Order, the United States Government is not a party to any contract with the Respondents.

XIX. Noncompliance

A. A willful violation or failure or refusal to comply with this Order may subject Respondents to a civil penalty of up to $25,000 per day in which the violation occurs or failure to comply continues, pursuant to the provisions of Section 106(b)(1) of CERCLA, 42 U.S.C. § 9606(b)(1). Failure to comply with this Order without sufficient cause may also subject Respondents to punitive damages of up to three times the total costs incurred by the United States for site response pursuant to Section 107(c)(3) of CERCLA, 42 U.S.C.§ 9607(c)(3).

B. EPA may take over the response action at any time if EPA determines that Respondents are not taking appropriate action. EPA may order additional actions it deems necessary to protect public health, welfare, or the environment.

XX. Opportunity to Confer

Respondents may request a conference with the Director, Hazardous Waste Management Division, EPA Region 9, or his staff to discuss the provisions of this Order. At any conference held pursuant to Respondents request, Respondents may appear in person or by counsel or other representatives for the purpose of presenting any objections, defenses or contentions which Respondents may have regarding this Order. If Respondents desire such a conference, Respondents must make a request orally within three (3) days of receipt of this Order, and confirm the request in writing within seven (7) days of the receipt of this Order.

XXI. Notice of Intent to Comply

Upon receipt of this Order, Respondents shall orally inform EPA of their intent to comply with the terms of this Order. The oral notice shall be confirmed within seven (7) days of the receipt of this Order by written notice to the Director. Failure to timely notify EPA of the Respondents' intent to comply will be construed by EPA as a refusal to comply.

If a Respondent will comply with only a part of the Order the Respondent must clearly identify which portions of the Order it will not comply with and state the reasons for noncompliance with the other portions of the Order.[2] In particular, for any

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2. EPA wishes to place Respondents on notice that expeditious completion of the diversion structures is of great importance. If Respondents are unable to comply with the required schedules, it is important that EPA be apprised of this fact as soon as possible.

portion of this Order with which a Respondent will not comply, Respondent shall state whether it has a good faith belief that it is not liable or that the response action required by this Order is inconsistent with the NCP or that it is unable to comply for some other identified reason. Notification to EPA that Respondents will not comply, and supplying EPA with the reasons for such non-compliance, does not excuse any non-compliance with this Order.

XXII. U.S. EPA Periodic Review to Assure Protection of Human Health and the Environment

To the extent required by Section 121(c) of CERCLA, 42 U.S.C. § 9621(c), and applicable regulations, EPA will review the Site at least every five (5) years after initiation of the remedial action to assure that the work performed pursuant to this Order protects human health and the environment. Until such time as EPA certifies completion of the work, Respondents shall conduct the requisite studies, investigations, or other response actions as determined necessary by EPA in order to permit EPA to conduct such review.

XXIII. Notice to State

Notice of the issuance of this Order has been given to the State of California. EPA will consult with the California Depart-

ment of Health Services, as appropriate, to ensure that the plans submitted by Respondents are consistent with State requirements.

XXIV. Effective Date

Notwithstanding any conferences requested pursuant to the provisions of this Order, this Order is effective on the date of execution by the Director, Hazardous Waste Management Division, EPA Region 9.

IT IS SO ORDERED on this 28 day of March, 1990.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

by: _____
Jeff Zelikson
Director, Hazardous Waste Management Division
EPA, Region 9

Contacts:
Rick Sugarek
Remedial Project Manager

Michael B. Hingerty
Assistant Regional Counsel

Appendix A - Record of Decision (Oct. 1986)
Appendix B - Prefinal Design for the Upper Spring Creek Diversion
Appendix C - Conceptual Design for the South Fork of Spring Creek Diversion
Appendix D - Statement of Work for Remedial Action Workplan

Appendix D

Statement of Work
for
Iron Mountain Mine

Upper Spring Creek Diversion
and
South Fork Spring Creek Diversion

Workplan for
Completion of Remedial Design
and
Implementation of Remedial Action

EPA Order No. 90 - 08

Section 1. INTRODUCTION

This statement of work (SOW) provides additional information on procedures and tasks for completing the remedial design (RD) and implementing the remedial action (RA) for the Upper Spring Creek and South Fork Spring Creek Stream diversions at the Iron Mountain Mine Superfund site pursuant to Order No. 90-08. The need for these remedial action components is presented in the October 3, 1986 Iron Mountain Mine Record of Decision (ROD) for an Interim Remedial Action.

The RD/RA program has the following objectives:

- To conduct the RD/RA program consistent with the ROD, CERCLA, SARA, NCP and other EPA guidance.
- To prepare all necessary documents, plans, and specifications to complete the remedial design (RD).
- To perform the selected remedy (RA) in accordance with plans and specifications approved by the U.S. Environmental Protection Agency (EPA).

This SOW has been completed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, the Superfund Amendments and Reauthorization Act of 1986 (SARA), the National Contingency Plan (NCP), and the following EPA guidance.

- EPA, Office of Solid Waste and Emergency Response (OSWER), Superfund Remedial Design and Remedial Action Guidance, Directive 9355.0-4A, June 1986.
- EPA, OSWER, Interim Guidance on Potentially Responsible Party Participation in Remedial Investigation and Feasibility Studies, Directive 9835.1A, May 1988.
- EPA, OSWER, CERCLA Compliance With Other Laws Manual, OSWER Directive 9234.1-01, EPA/540/G-89/006, August 1988.
- EPA, OSWER, CERCLA Compliance With Other Laws Manual: Part II. Clean Air Act and Other Environmental Statutes and State Requirements, OSWER Directive 9234.1-02, EPA/540/G-89/009, August 1989.

This SOW is organized into five sections, including this introductory section. Information presented in the remaining four sections is summarized as follows:

- Section 2--Scope of the Remedial Action (RA). This section describes what work will be accomplished under Administrative Order No. 90-08.

- Section 3--Remedial Design/Remedial Action. This section provides additional detail on the plans, reports and activities required pursuant to Section VI of the Order, and further detailed in EPA's Superfund Remedial Design and Remedial Action Guidance (OSWER Directive 9355.0-4A).

- Section 4--Operations and Maintenance. This section identifies the long-term operations and maintenance requirements and monitoring requirements.

- Section 5--Records and Reporting. This section provides additional detail on the data management system required by the Order and the routine reporting required during RD/RA and operations and maintenance.

Section 2. SCOPE OF THE REMEDIAL ACTION

Below is presented a description of the work to be performed to implement the Upper Spring Creek Diversion and the South Fork Spring Creek Diversion components of the October 3, 1986 ROD.

Upper Spring Creek Diversion

The Upper Spring Creek Diversion consists of a drop inlet structure, pipeline, energy dissipation structure and necessary miscellaneous private property and stream bed improvements. Upper Spring Creek will be diverted to Flat Creek with a maximum diversion of 800 CFS. A cut and cover methodology will be used to provide flow access for Upper Spring Creek to Flat Creek.

- Appendix B provides EPA's Prefinal Design consisting of the final technical specification and drawings for the project.[1]

- The Respondents must submit for EPA review and approval a Pre-final Design. The Pre-final Design must address all technical and legal aspects necessary to construct the Upper Spring Creek Diversion consistent with the ROD, the requirements of EPA's Order, this SOW, and all policy, regulations and guidance applicable to this remedial design and remedial action project.

- The Respondents must submit for EPA review and approval a draft workplan and schedule for implementing the Upper Spring Creek Diversion. The workplan and schedule must provide for all documents described in the Order and in this SOW.

- The Respondents must submit for EPA review and approval a Final Design and a Final Workplan and Final Schedule.

- The Respondents must provide for implementation of the remedial action to construct the Upper Spring Creek Diversion in accordance with the Order, this SOW, the approved design, workplan, and schedule, all applicable regulations, policy and guidance.

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1. EPA may furnish Respondents with addenda that supplement the technical specifications and drawings prior to finalization. EPA is also developing a set of technical specifications and drawings providing for private property access and stream bed improvements.

South Fork Spring Creek Diversion

The South Fork Spring Creek Diversion consists of a drop inlet structure, pipeline and energy dissipation structure. The diversion as now planned will route up to 200 CFS around the Spring Creek Reservoir and discharge into Spring Creek below the Spring Creek Debris Dam (SCDD). All structures will be located on U.S. Bureau of Reclamation land.

- Appendix C provides EPA's conceptual design for the South Fork Spring Creek Diversion project. EPA anticipates completion of the Pre-final Design (approximately 90% complete) in early April. The Pre-final Design will consist of the draft technical specifications and drawings for the project.

- The Respondents must submit for EPA review and approval a Pre-final Design. The Pre-final Design must address all technical and legal aspects necessary to construct the South Fork Spring Creek Diversion consistent with the ROD, the requirements of EPA's Order, this SOW, and all policy, guidance and regulations applicable to this remedial design and remedial action project.

- The Respondents must submit for EPA review and approval a draft Workplan and Schedule for implementing the South Fork Spring Creek Diversion. The workplan and schedule must provide for all documents described in the Order and in this SOW.

- The Respondents must submit for EPA review and approval a Final Design, a Final Workplan, and a Final Schedule.

- The Respondents must provide for implementation of the remedial action to construct the South Fork Spring Creek Diversion in accordance with the Order, this SOW, the approved final design, workplan and schedule, and all applicable regulations, policy and guidance.

Section 3. REMEDIAL DESIGN/REMEDIAL ACTION

This Section discusses general obligations with respect to the RD/RA workplan and schedule, prefinal design, final design and remedial action. This Section also contains additional detail on the specific tasks and reports to be included in the workplan and schedule.

I. RD/RA Work Plan

As required by Section VI(B.1 & 2), the Respondents shall prepare an RD/RA work plan for each diversion. The workplan shall serve as the overall work plan for designing, constructing, operating, maintaining, and monitoring the remedial action. The workplan shall be consistent with this SOW, the ROD, CERCLA, the NCP, and other EPA guidance, and shall expand on how the described tasks will be completed. This plan shall be completed in accordance with standard remedial investigation work planning guidance (OSWER Directive 9355.3-01). Statutes, regulations, guidelines, policies and procedures that shall be used in developing the workplan and conducting the work in this SOW are listed in Table 1. The workplan shall address how the drawings and technical specifications shall be correlated in the final design. The plan shall document the responsibilities and authority of all organizations and key personnel involved with both the RD and RA. After approval by EPA, the plans described in this section shall be part of the RD/RA work plan.

The workplan shall be accompanied by a schedule which states when the tasks are to be completed. The schedule shall be consistent with the specific requirements identified in this section, including the requirement that certain final workplans be submitted with the final design.

II. Prefinal Design

The Respondents shall submit for EPA review and approval a prefinal design report for each diversion. The submitted construction plans and specifications shall reflect 90 percent completion of design.

At a minimum, the prefinal design submittal shall discuss the following:

- Design strategy and the design basis
- The technical factors of importance, such as currently accepted environmental control measures and construction practices and techniques
- Detailed justification of assumptions made
- Possible sources of error and references to potential problems
- Plans and specifications

- o Design rationale and calculations, including estimates of capital and O&M costs
- o Performance standards

EPA's major environmental compliance and technical review will occur on the prefinal design submittal. EPA will provide to the Respondents marked drawings, marked calculation sheets, and/or written comments on the prefinal design submittal. In the event the prefinal design differs from the design documents furnished Respondents by EPA, EPA may require that Respondents furnish an ARARs report. If an ARARs report is required, the Respondents shall submit for EPA review and approval a report that describes how the revised plans and specifications meet the chemical-, location-, and action-specific ARARS identified in the ROD. This report shall document how each ARAR has been incorporated into the revised plans, specifications, and reports shall provide a cross-reference to the specific plan, specification, or report showing that the ARAR will be met.

III. Final Design

The final design shall incorporate EPA's corrections and comments. The Respondents shall correlate the plans and specifications and also correct and cross-check them. The final design submittal shall consist of the following:

- o Final design and specifications at 100 percent complete
- o A final construction cost estimate
- o Final Health and Safety Plan
- o Final CQAP
- o Final CMP
- o Final startup and training plan
- o Final SAP
- o Final draft O&M plan
- o Final contingency plan

The quality of the design documents shall be sufficient for inclusion in a package for contractors who will be submitting bids for the construction project. EPA shall review this submittal to insure that the Respondents have adequately addressed all concerns and comments generates during the prefinal design review process. If further revisions to the design are required, the Respondents shall be directed to make them.

During completion of RD activities, the Respondents shall also be responsible for the following elements:

- o Selecting, as needed, a support contractor to complete RD in accordance with the schedule and requirements described in this document

- o Managing the completion of identified RD tasks, including preparation of final design plans and specifications and reports

- o Approving and accepting the RD from the selected contractor and obtaining concurrence from EPA

IV. Remedial Action.

Following completion and approval of the RD package, Respondents must take action to initiate RA activities. EPA's Superfund Remedial Design and Remedial Action Guidance (OSWER Directive 9355.0-4A) presents the RA process when the responsible party (the Respondents) takes the lead role. Pursuant to this guidance, Respondents shall be responsible for the following general obligations:

- o Advertising for and selecting a construction contractor and obtaining concurrence from the EPA on the bidder selection.
- o Implementation of the approved workplan and schedule
- o Providing monthly progress reports to EPA throughout the project.
- o Holding a prefinal construction conference, which shall occur upon preliminary construction completion. The final O&M plan shall be submitted to EPA at this conference.
- o Holding a prefinal inspection, which shall occur after the prefinal construction conference.
- o Preparing a prefinal inspection report to submit to EPA.
- o Holding a final inspection and preparing certification that the project was properly constructed.
- o Preparing a final construction report.
- o Preparing a RA report to submit to EPA.
- o Undertaking the O&M aspects of the project, including the 5-year review.
- o Preparing an O&M report to submit to EPA.
- o Obtaining EPA acceptance of the completed project.

V. Elements of workplan and schedule as provided in paragraphs 1.2 and 2.2 of Paragraph B of Section VI of the Order.

Following are specific requirements for the matters identified in paragraphs B(1.2 and 2.2) of Section VI of the Order:

(i) Health and Safety Plan

The Respondents shall submit for EPA review and comment a Health and Safety Plan to protect the health and safety of individuals who will be on the site during design and construction. Respondents shall complete the Health and Safety Plan in accordance with Section VII of the Order and this paragraph. For consistency with appropriate EPA, OSHA, MSHA, and State health and safety requirements, the following reference list shall be used as guidance in developing the Health and Safety Plan:

- CERCLA sections 104(f) and 111(c) (6)
- EPA Order 1440.2--Health and Safety Requirements for Employees Engaged in Field Activities
- EPA Order 1440.1--Respiratory Protection
- EPA Occupational Health and Safety Manual
- EPA Standard Operating Safety Guide Manual (OSWER Directive 9285.1-02; July 1988)
- EPA Field Standard Operating Procedures Manual: No. 9--Site Safety Plan (OSWER Directive 9285.2-05; April 1985)
- Federal Mine Safety and Health Act, 30 U.S.C. Sections 801.962.
- Part 1910 of 29 C.F.R. revised July 1, 1982, OSHA Standards for General Industry
- National Institute of Occupational Safety and Health Manual of Analytical Methods, Volumes I-VII
- Threshold Limit Values (TLV) for Chemical Substances and Physical Agents in the Work Environment with Intended Changes. Adopted by the American Conference of Governmental Industrial Hygienists. Latest edition.
- ANSI Z88.2--1980, American National Standard Practices for Respiratory Protection
- Air Sampling Instruments for Evaluation of Atmospheric Contaminants, 6th edition, 1983, American Conference of Governmental Industrial Hygienists
- Appropriate State health and safety statutes

EPA will provide comments on the draft Health and Safety Plan. After making necessary corrections, the Respondents shall submit the final Health and Safety Plan with the final design documents.

(ii) Construction Management Plan

The Respondents shall submit, for EPA review and approval, a construction management plan (CMP). The CMP shall document the overall management plan for construction activities and shall include project organization and responsibilities; communication and documentation procedures; change orders and submittal review and approval procedures.

EPA will provide comments on the submitted draft CMP. After making necessary corrections, the Respondents shall submit the final CMP with the final design documents.

The Respondents shall be responsible for managing the construction process including full-time construction inspection. The full-time onsite inspector shall verify compliance with all environmental and technical requirements identified in the contract; review all daily reports and construction activities to verify that all work complies with all contract requirements; note and resolve all discrepancies immediately; and review and initial all contractor reports (daily, weekly, monthly, etc.).

(iii) Construction Quality Assurance Plan

A site-specific Construction Quality Assurance Plan (CQAP) shall be prepared by the Respondents. The plan will provide construction project organization guidelines that shall outline and identify construction performance criteria and construction quality control (QC) and quality assurance (QA) responsibilities of the construction contractor, independent oversight contractor and Respondents. The CQAP should be consistent with EPA QA/QC procedures.

As provided in Paragraph A.5 of Section VI of the Order, the Respondents shall submit for EPA review and approval the name of a qualified contractor who will perform independent oversight of the Respondents' completion of remedial action activities under the Order and this SOW. The Respondents' Construction Quality Assurance Plan shall detail the role and relationship of the independent oversight contractor and specify reporting and documentation relative to independent oversight. Upon EPA approval, the Respondents shall contract for such services and shall maintain such contract until completion of the remedial action required by this Order.

EPA will provide comments on the draft CQAP. After necessary corrections the Respondents shall submit for EPA final review and approval the final CQAP with the final design documents.

(iv) Startup and Training Plan

The Respondents shall submit for EPA review and approval a plan that governs requirements for startup and operations of any monitoring system; and appropriate operational and monitoring procedures training once the startup has been accomplished.

EPA will provide comments on the draft startup and training plan. After making necessary corrections, the Respondents shall submit the final startup and training plan with the final design documents.

(v) Operations and Maintenance Plan

The Respondents shall submit for EPA review and approval a draft O&M plan. The following basic elements of an O&M plan shall be used by the Respondents in preparing the site-specific O&M plan:

A. Description of Normal Operation and Maintenance
   1. Description of tasks for operation; coordination with state and federal agencies.
   2. Description of tasks for maintenance
   3. Description of responses to expected prescribed treatment of operating conditions
   4. Schedule showing frequency of each O&M task

B. Description of Potential Operating Problems

1. Description and analysis of potential operating problems; coordination with state and federal agencies
2. Sources of information regarding problems
3. Common remedies

C. Description of Routine Monitoring and Laboratory Testing
1. Description of routine monitoring tasks and special event monitoring tasks.
2. Description of required laboratory tests and their interpretation
3. Required QA/QC protocols and procedures (i.e., analytical techniques; chain-of-custody procedures; sample handling and preservation procedures; etc.)
4. Schedule of monitoring frequency and when, if so provided, to discontinue

D. Description of Alternate O&M
1. Should systems fail, alternate procedures to prevent undue hazard
2. Analysis of vulnerability and additional resource requirement should a failure occur

E. Safety Plan
1. Description of precautions, necessary equipment, etc., for site personnel
2. Safety tasks required in event of systems failure (may be linked to site safety plan developed during remedial responses)

F. Description of Equipment
1. Equipment necessary to plan
2. Installation of monitoring components
3. Maintenance of site equipment
4. Replacement schedule for equipment and installed components

G. An O&M annual budget, which should include, but not be limited to, the following:
1. Cost of personnel
2. Costs of preventive and corrective maintenance
3. Costs of equipment, supplies, etc.
4. Costs of any contractual obligation (e.g., lab expenses)
5. Costs of operation (e.g., energy costs, etc.)

H. Record and Reporting Mechanisms Required
1. Daily operating logs during special events
2. Laboratory records
3. Records of operating costs
4. Mechanism for reporting emergencies
5. Personnel and maintenance records
6. Monthly/annual reports

The Respondents' O&M plan shall consider effects of implementing these two diversions on operations of the Spring Creek Debris Dam by the U.S. Bureau of Reclamation. The O&M Plan must provide for a mechanism to set operations goals and periodically reassess them in coordination with state and federal agencies.

EPA will provide comments on the draft O&M plan. After making necessary corrections, the Respondents shall submit the final draft O&M plan with the final design documents. The O&M plan will be made final and submitted at the prefinal construction conference described in Section 3.

(vi) Sampling and Analysis Plan

The Respondents shall prepare a site-specific sampling and analysis plan (SAP). The SAP shall describe the scope of all field sampling activities, the associated sampling methodologies, ongoing monitoring activities, the personnel who will implement these tasks, quality assurance/quality control protocols and personnel, and the laboratory methodologies and protocols. The Sampling and Analysis Plan shall comply with the requirements for completion of a Quality Assurance/Quality Control Plan as outlined in Section VIII of the Order.

EPA will provide comments on the draft SAP. After making necessary corrections, the Respondents shall submit the final SAP with the final design documents.

The following reference list shall be used as guidance in developing the SAP:

- A Compendium of Superfund Field Operations Methods (OSWER Directive 9355.0-14; December 1987)
- EPA Field Standard Operating Procedures Manual: No. 4--Site Entry; No. 6--Work Zones (OSWER Directive 9285.2-01, -04; January and April 1985)
- Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (OSWER Directive 9355.3-01; October 1988)

(vii) Contingency Plan

The Respondents shall submit a draft contingency plan. The contingency plan should anticipate potential problems associated with or failures of implementing the diversions and provide for monitoring programs and possible responses.

EPA will provide comments on the draft Contingency Plan. After necessary corrections, the Respondents shall submit the final Contingency Plan with the final design documents.

(viii) Final Construction Drawings and Specifications

(ix) Final Cost Estimate

(x) Submittal of Bid Documents for EPA Review

The Respondents shall have the primary responsibility for reviewing contractor's bids and submitting bid documents for EPA review. EPA will review the Respondents' determination with respect to whether the selected bidders are responsible and responsive to the requirements of the bid solicitation. To determine if a bidder is responsive, for example, the bid bonds must be in the proper form and amount, and the required insurance binder must be provided. To determine if a bidder is responsible, the bidder must possess the capability and experience, as required in the solicitation, to perform the remedial action in a safe and timely manner and at the price bid. EPA will review the Respondents' bidder selection and decide if any potential for conflict of interest exists. Respondents must demonstrate that their contractor has the technical and managerial capability to handle the project and has no conflict of interest.

(xi) Completion of Construction

Upon completion of construction, Respondents shall attend a prefinal construction conference, provide for a prefinal inspection and submit a prefinal inspection report, as provided herein.

(a) Prefinal Construction Conference

EPA shall attend a prefinal construction conference held by the Respondents upon preliminary completion of the construction phase of the project. Suggested items to be covered at the conference include, but are not limited to, final O&M plan submittal, demobilization activities, security requirements, prefinal inspection schedule, and facility startup and testing.

(b) Prefinal Inspection

A prefinal construction inspection shall be conducted and shall consist of a walk-through inspection of the project site. EPA will inspect the completed site work to determine whether the project is complete and consistent with the contract documents and the ROD. EPA will note any unfinished construction items discovered during the inspection.

The Respondents shall certify that the equipment and construction have met the intent of contract specifications. Retesting shall be done if deficiencies are revealed.

(c) Prefinal Inspection Report

After the prefinal inspection, the Respondents shall prepare and submit to EPA for review and comment a prefinal inspection report, which shall outline any unfinished construction items, actions required to resolve items, a completion date for these items, and a date for final inspection.

(d) Final Inspection

After all unfinished construction items are completed, a final inspection shall be conducted; the participants shall include all parties from the prefinal inspection. The final inspection shall consist of a walk-through inspection of the project site. EPA shall use the prefinal inspection report as a checklist, with the inspection focusing on the outstanding construction items identified in the prefinal inspection. EPA shall confirm that all items have been resolved. If any items are still unresolved, this inspection shall be considered a prefinal inspection, which shall require another prefinal inspection report and final inspection.

(xii) Certification of Construction Completion

Before preparing the final construction report, the Respondents shall provide EPA with a notarized certification that the remedy has been constructed in conformance with the drawings and specifications and all construction is complete.

(xiii) Final Construction Report

After the final inspection is satisfactorily completed, a final construction report shall be submitted by the Respondents to EPA for review. The final construction report will include the following elements:

- A brief description of outstanding construction items from the prefinal inspection and an indication that the items were resolved
- A synopsis of the work defined in the SOW and certification that this work was performed
- An explanation of any modifications to work in the SOW and why these were necessary

If EPA is satisfied that the remedy has been properly constructed, EPA will provide written notice to the Respondents of EPA's acceptance of the constructed project.

(xiv) Final Remedial Action Report

This report is more fully discussed in Section 4 below.

Section 4. OPERATIONS AND MAINTENANCE

Upon EPA's acceptance of the constructed project, regular O&M activities will commence as provided in Paragraph E of Section VI of the Order. These O&M activities will include the following:

- o Ongoing monitoring
- o O&M of the constructed projects
- o Implementation of contingency measures, if required
- o Completion of 5-year reviews and a final remedial action report
- o Completion of a final O&M report.

Following is additional detail on the final Remedial Action Plan, the 5-year review and the final operations and maintenance report.

I. Final Remedial Action Report

The constructed remedy will require several years to provide sufficient data that it is operational and functional. Concurrent with the first 5-year review report, the Respondents shall prepare and submit a final remedial action report to EPA. The RA report will include the following elements:

- o Synopsis of the operation aspects of the remedy
- o Synopsis of monitoring data to substantiate that the remedy is functioning as intended
- o Recommendations for long-term O&M activities, if changes, are anticipated to existing plans

The remedial action report will be reviewed by EPA. If EPA is satisfied that the remedy is performing adequately, the Regional Administrator shall provide written notice to the appropriate party of EPA's acceptance of remedial action phase of the project.

II. Five Year Report

The Respondents will prepare an evaluation of the O&M data regarding performance of the constructed remedy. They will review, interpret, and summarize O&M data for surface water quality and flow; and whether it is meeting the interim remedial action objectives. The Respondents shall present a final O & M Plan for EPA review concurrent with completion of the remedial action report and the first 5-year review.

III. Final O&M Report

The Respondents shall continue O&M activities, including O&M progress reports and 5-year reviews, until EPA determines that no further cleanup or O&M is required. At that point, the Respondents shall submit to EPA a final O&M report for review. This report shall summarize the O&M activities and results of 5-year reviews conducted to date. If EPA is satisfied that the O&M phase of RA is complete, EPA shall provide written notice to the appropriate party of EPA's acceptance of the completed project.

Section 5. RECORDS AND REPORTING

This section provides additional detail on the data management system required by the Order and the routine reporting required during RD/RA and operations and maintenance.

I. Data Management System

A RD/RA program generates extensive information that must be consistently well documented and managed. As provided in Section 12(E) of the Order, the Respondents shall develop a Data Management System to document the following types of data management:

- Information transfer
- Document control

1. Information Transfer

The Respondents shall provide to EPA hard copies of the following:

- All invalidated analytical data on CLP Form I's or in a similar format, within the 40 calendar days of the last sample shipment to the laboratory
- All validated analytical data on CLP Form I's or in a similar format, within 75 calendar days of the last sample shipment to the laboratory

As part of any sampling event the Respondents shall transfer to EPA copies of the following documents within the 180 calendar days of the last sample shipment to the laboratory for that event. These may be submitted as part of a design report or O&M progress report:

- All field measurements, logbooks, and notebooks
- Laboratory purge files, including but not limited to, sample tags, chain-of-custody records, copies of sample tracking records, analysts' logbook pages, instrument logbook pages (including instrument conditions), bench sheets, instrument read-out records, computer printouts, chromatographic charts, raw data summaries, correspondence memoranda, and document inventory
- Data validation reports
- All test results for construction QA/QC testing

Each submittal shall be inventoried, organized, and audited consistent with procedures to be provided by EPA.

2. Document Control

The Respondents shall establish a document control system with the following objectives:

- Facilitate retrieval of information
- Establish and maintain a central file containing all documents pertaining to the SOW, RD, and RA
- Form a basis for adding to the administrative record
- Establish procedures to ensure that all documents are routinely placed in the central file.

The Respondents shall develop an inventory of all documents contained in the central file. This inventory shall contain the document date; the author(s) including title and affiliation; the recipient(s), including title and affiliation; title of the document; summary of its content; and number of pages.

The Respondents shall preserve and retain all records and documents relating to the site in accordance with section XIV of the Order.

II. Reports provided for in Paragraph C of Section VI of the Order

The Respondents shall submit to EPA a variety of reports during the RD and RA phases of the project. EPA shall use these reports to monitor the design, construction, and O&M activities. The content of these reports shall be sufficient to develop a chronological record of all site activities.

1. Monthly written reports

The Respondents at a minimum, shall provide EPA with signed monthly progress reports during RD/RA. These reports shall contain the following:

- A description and estimate of the percentage of the remedial design/remedial action completed
- Summaries of significant findings during remedial design/remedial action
- Summaries of all changes made in the remedial design/remedial action during the reporting period
- Summaries of all contacts with representatives of the local community, public interest groups, or State government during the reporting period
- Summaries of all problems or potential problems encountered during the reporting period
- Change orders and claims made
- Actions taken to rectify problems
- Changes in personnel during the reporting period
- Projected work for the next reporting period, including a schedule by week of construction activities for the next month
- Copies of daily reports, inspection logs, laboratory/monitoring data, etc.

2. Daily and weekly construction reports

As described in Section 3 of this SOW, the Respondents shall have a full-time, onsite inspector during construction. The onsite inspector shall review all daily reports and construction activities to verify that all work complies with all contract requirements. The onsite inspector shall review all reports (daily, weekly, and monthly) and shall initial each.

The daily reports shall be accumulated for 1 week and sent to EPA. The daily reports, at a minimum, shall discuss the daily activities, summaries of problems and actions taken to rectify problems, and change orders. Respondents shall provide these reports during RD/RA and operations and maintenance.

3. Monthly operations and maintenance reports

The Respondents shall prepare and submit ongoing O&M reports to EPA. These reports shall be provided monthly during operations and maintenance. Each report shall include, at a minimum, the following elements:

- Description of O&M activities performed during the period
- O&M activities to be undertaken during the next time period

Table 1
STATUTES, REGULATIONS, AND POLICY AND TECHNICAL GUIDELINES

1. Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (CERCLA), 42 U.S.C. Section 9601-9675.

2. Department of Health and Human Services. National Institute for Occupational Safety and Health (NIOSH), Occupational Safety and Health Administration (OSHA), U.S. Coast Guard (USCG), U.S. Environmental Protection Agency (EPA), Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities. 1985. DHHS (NIOSH) Publication No. 85.115.

3. Department of Labor, OSHA, Safety and Health Standards for Construction, 29 C.F.R. Part 1910.

4. Department of Labor, OSHA, Safety and Health Standards for General Industry, 29 C.F.R. Part 1910.

5. EPA, Contract Laboratory Program. Statement of Work, Inorganics Analysis (SOW 7/87), July 1987.

6. EPA, Data Quality Objectives for Remedial Response Activities, OSWER Directive 9355.0-7B, March 1987.

7. EPA, Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analysis, Draft July 1988.

8. EPA, Guidelines for Carcinogen Risk Assessment, 51 Federal Register 33992 (1986).

9. EPA, Guidelines for Estimating Exposures, 51 Federal Register 34042 (1986).

10. EPA, Guidelines for Health Assessment of Suspect Developmental Toxicants, 51 Federal Register 34028 (1986).

11. EPA, Guidelines for the Health Risk Assessment of Chemical Mixtures, 51 Federal Register 34014 (1986).

12. EPA, Guidelines for Mutagenicity Risk Assessment, 51 Federal Register 34006 (1986).

13. EPA, Hazardous Waste Engineering Research Laboratory, Office of Emergency and Remedial Response (OERR), Remedial Action at Waste Disposal Sites: Handbook (Revised) EPA/625/6-85/006, 1985.

14. EPA, Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans (QAPP), QAMS-005/80, EPA-600/4-83-004, 1980.

15. EPA, OERR and Office of Solid Waste and Emergency Response (OSWER), A Compendium of Superfund Field Operations Methods, Directive 9355.0-14, EPA/540/P-87/001, 1987.

16. EPA, OERR, Data Quality Objectives for Remedial Response Activities, OSWER Directive 9355.0-7B, March, 1987

17. EPA, OERR, Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (part A), EPA/540/1-89/002, December 1989.

18. EPA, OERR, Risk Assessment Guidance for Superfund Volume II Environmental Evaluation Manual, EPA/540/1-89/001, March 1989.

19. US EPA Region 9 Guidance for Preparing Quality Assurance Project Plans for Superfund Remedial Projects, Document Control No. 9QA-03-89, September 1989.

20. EPA, OSWER, Hazardous Waste Bibliography, OSWER Directive 9380.1-02, EPA/540/1-87/001, 1987.

21. EPA, OSWER, CERCLA Compliance With Other Laws Manual, OSWER Directive 9234.1-01, EPA/540/G-89/006, August 1988.

22. EPA, OSWER, CERCLA Compliance With Other Laws Manual: Part II. Clean Air Act and Other Environmental Statutes and State Requirements, OSWER Directive 9234.1-02, EPA/540/G-89/009, August 1989.

23. EPA, OSWER, Superfund Exposure Assessment Manual, OSWER Directive 9285.5-1, April 1988.

24. National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300, as amended or modified.